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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/889,625	07/19/2001	Kiyoshi Iwanaga	Q65479	6942

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Sughrue Mion Zinn Macpeak & Seas
2100 Pennsylvania Avenue NW
Washington, DC 20037-3202

EXAMINER

NGUYEN, NGOC YEN M

ART UNIT	PAPER NUMBER
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1754

DATE MAILED: 03/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/889,625

Applicant(s)

IWANAGA ET AL.

Examiner

Ngoc-Yen M. Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 December 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,4,5 and 7-11, 13-14 is/are rejected.
- 7) ☒ Claim(s) 2,3,6 and 12 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on December 15, 2004 has been entered.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

There is no antecedent basis for "the tubular reactor" in claim 1.

Claims 2-3, 6, 12 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: the prior art does not teach or suggest a process for producing chlorine by oxidation of chlorine dioxide using at least two reaction zones each comprising a

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catalyst-packed bed (i.e., fixed bed) which are arranged in series and wherein the at least two reaction zones are formed by packing at least two kinds of the catalysts in a tubular reactor, or by independently controlling the temperatures of said at least two reaction zones, or the raw materials supplied to the first reaction zone is 70% by volume or less based on the total volume of all reaction zones.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 4, 5, 7-11, 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hibi et al (5,871,707) in view of either Kulhmann et al (4,299,977) or Fornoni (4,188,184).

Hibi '707 discloses a process for producing chlorine by oxidation of hydrogen chloride with oxygen using ruthenium catalyst. The reaction system in the production of chlorine is not specifically limited, but a flow system is preferred and a fixed bed gas phase flow system is more preferred (note column 4, lines 35-40). The ruthenium catalyst is supported by a carrier (note claim 1) and the reaction temperature is between 100-500°C (note claim 1).

A theoretical molar amount of oxygen for hydrogen chloride is $\frac{1}{4}$ mol, but oxygen is preferably supplied in a 0.1-fold to 10-fold amount, for the theoretical amount. The

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flow rate of the raw material, hydrogen chloride, to the catalyst is represented by GHSV under atmospheric pressure in the base of the fixed bed gas phase flow system, is preferred from about 10 h^{-1} to 20000 h^{-1} (note column 4, lines 51-59). Thus, with respect to the encompassing and overlapping ranges previously discussed, the subject matter as a whole would have been obvious to one of ordinary skill in the art at the time of invention to select the portion of the prior art's range which is within the range of the applicants' claims because it has been held prima facie case of obviousness to select a value in a known range by optimization for the results. *In re Boesch*, 205 USPQ 215. Additionally, the subject matter as a whole would have been obvious to one of ordinary skill in the art at the time invention was made to have selected the overlapping portion of the range disclosed by the reference because overlapping ranges have been held to be a prima facie case of obviousness. *In re Malagari*, 182 USPQ.

Hibi '707 specifically teaches that lower reaction temperature is preferred, i.e., from $100\text{-}500^{\circ}\text{C}$ (note column 4, lines 40-45), and since it is well known in the art that the oxidation of hydrogen chloride is an exothermic reaction, it would have been obvious to one skilled in the art to control the temperature in the process of Hibi '707 within the desired range by removing any excess generated heat.

In Hibi '707, the fixed bed gas phase flow system is considered to have an inlet zone and an outlet zone, which would read on the required "at least two reaction zones" because in the instant claim 1, the limitation of "at least two reaction zones" does not require that the two zones have different catalyst (as required in the instant claim 2) or the two zones have their reaction temperature independently controlled (as required in

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the instant claim 3). The claimed language is given a broadest reasonable interpretation.

The difference is Hibi '707 does not disclose the use of jacket, outside of the reactor as the indirect means for heating and/or cooling the reactor.

Kuhlmann '977 that suitable indirect heat exchange means, which are known in the art, include a cooling jacket, an internal cooling coil, internal cooling tubes or an external heat exchanger such as a tube and shell heat exchanger (note column 5, lines 28-34).

Alternatively, Fornoni teaches that well known systems of indirect heating are heating coils, double jackets etc., in contact with the treated substances (note column 4, lines 28-33).

It would have been obvious to one of ordinary skill in the art, at the time the invention was made to use a jacket outside of the reactor as indirect heating means for the process of Hibi '707 as suggested by Kuhlmann '977 or Fornoni because such means would facilitate the controlling of the reaction temperature of Hibi '707.

Applicant's arguments with respect to claims 1-14 have been considered but are moot in view of the new ground(s) of rejection.


The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ngoc-Yen M. Nguyen whose telephone number is (571) 272-1356. The examiner is currently on Part time schedule.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Stan Silverman can be reached on (571) 272-1358. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed (571) 272-1700.



Ngoc-Yen M. Nguyen
Primary Examiner
Art Unit 1754

nmn
February 7, 2005